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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/362,924	07/27/1999	WAICHING CHOW	1945.P2/USA/	7451

32588 7590 10-03-2002
APPLIED MATERIALS, INC.
2881 SCOTT BLVD. M/S 2061
SANTA CLARA, CA 95050

EXAMINER

OLSEN, ALLAN W

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 10/03/2002

19

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/362,924

Applicant(s)

CHOW ET AL.

Examiner

Allan W. Olsen

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 September 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-7,9-15,17-19,24,26,27,29-36,39-42,44-49 and 51-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,4-7,9-15,17,18,27,29-36,39,40 and 46-49 is/are allowed.
- 6) ☒ Claim(s) 19,24,26,41,42,44,45 and 51-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/16/2002 has been entered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 41, 42, 44 and 45 are rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent 5,865,896 issued to Nowak et al. (hereinafter, Nowak).

Nowak teaches a method for cleaning a reaction chamber by providing an energized first process gas to the chamber and applying RF power to an antenna that is adjacent to the chamber ceiling to enhance the removal of residue from the ceiling.

See: abstract; col. 4, lines 16-25; col. 6, lines 22-38; col. 7, lines 18-42.

The indicated allowability of claim 45 is withdrawn for the reason stated below which relate to the examiner's interpretation of the claim. Claim 45 is dependent upon claim 41. Claim 41 requires the first process to include an oxygen containing gas. Claim 45 requires the oxygen containing gas to consist essentially of oxygen. Claim 45 does not limit the entire first process gas to consist essentially of oxygen, it requires only the oxygen containing component of the first process to consist essentially of oxygen. In light of this interpretation, it is appropriate to apply Nowak as above.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 19, 24, 26 and 51-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,159,811 issued to Shin et al. (hereinafter, Shin) in view of U.S. Patent 5,891,799 issued to Tsui.

Shin teaches etching a silicide layer with an etchant that comprises SF₆ or CF₄ and N₂ fluorine. Subsequent to the silicide etch step Shin teach applying an oxygen plasma to the substrate. Shin teaches using a LPCVD or PECVD silicon nitride layer as a hard mask. See: col. 6, line 16 - col. 7, line 2; column 7, line 58 - column 8, line 33.

Shin does not teach or least does not provide any details pertaining to a residue generating, first etch step that precedes the silicide etch. Shin does not teach the process by which the silicon nitride layer is patterned into an etching mask.

Tsui teaches a residue generating etching method for patterning a silicon nitride, hard mask.

It would have been obvious to one skilled in the art to pattern the hard mask of Shin by the method of Tsui because while Shin teaches the use of a nitride hard mask , Shin is silent with regard to this specific manner in which the nitride mask is patterned. Therefore, the skilled artisan would be motivated to turn to the teaching of Tsui because Tsui provides the details that are necessary to create a pattern in Shin's hard nitride mask.

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Allowable Subject Matter

Claims 1, 4-7, 9-15, 17, 18, 27, 29-36, 39, 40 and 46-49 are allowed.

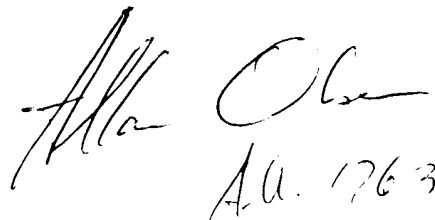
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 703-306-9075.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg Mills, can be reached on 703-308-1633.

The examiner's Right-Fax (direct to desktop) phone number is 703-872-9684. Alternatively, the general fax numbers for TC1700 are 703-872-9310 (non-after finals) and 703-872-9311(after-final).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Allan Olsen, Ph.D.
September 21, 2002



A.U. 1763